HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Whatcom Creek Pink Program
Species or Hatchery Stock:	Pink (*Onchorynchus gorbuscha*)
Agency/Operator:	Bellingham Technical College
Watershed and Region:	Whatcom Creek North Puget Sound
Date Submitted:	March 17, 2003
Date Last Updated:	January 22, 2003

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Whatcom Creek Pink

1.2) Species and population (or stock) under propagation, and ESA status.

Nooksack River Pinks (*Oncorhynchus gorbuscha*) - not listed

1.3) Responsible organizations and individuals

Name(and title):	Earl Steele, Hatchery Manager	
Organization:	Bellingham Technical College	
Address:	3028 Lindberg Ave Bellingham, WA 98225-1599	
Telephone:	(360) 715-8352	
Fax:	(360) 733-3671	
Email:	**esteele@btc.ctc.edu**	
Name (and title):	Chuck Phillips, Region 4 Fish Program Manager Ted Thygesen, Nooksack Complex Manager	
Agency or Tribe:	Washington Department of Fish and Wildlife	
Address:	600 Capitol Way North, Olympia, Wa. 98501-1091	
Telephone:	(425) 775-1311 Ext 120	(360) 676-2138
Fax:	(425) 338-1066	(360) 738-6291
Email:	**phillcep@dfw.wa.gov**	**thygetlt@dfw.wa.gov**

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

This facility works closely with the WDFW Kendall Creek Hatchery and often sharing both labor and equipment between the two facilities.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Bellingham Technical College provides the hatchery facilities through a lease with the City of Bellingham Parks Department, which owns the property. The college also provides most operational costs and provides one full-time hatchery manager and student labor. Funding for fish feed is through Aquatic Lands Enhancement Account (ALEA) funding provided to WDFW for Co-op fish production. Surplus egg and carcass monies are also utilized.

1.5) Location(s) of hatchery and associated facilities.

Whatcom Creek Hatchery: Located at the mouth of Whatcom Creek (01.0566) at RM 0.5.

1.6) Type of program.

Isolated recovery

1.7) Purpose (Goal) of program.

The goal of this program is to produce an egg source to restore several depleted sub-stocks of pink salmon within the Nooksack - Whatcom Creek basin.

1.8) Justification for the program.

Establish egg source for enhancement of streams that may have natural disasters and need enhancement as well as have a source of pink eggs for enhancement groups, if needed.

1.9) List of program "Performance Standards".

1.10) List of program "Performance Indicators".

Performance Standards and Indicators for Puget Sound **Isolated Recovery** Pink program.

Performance Standard	Performance Indicator	Monitoring and Evaluation Plan
Produce adult fish for hatchery broodstock	Survival and return rates	Monitor catch and survivals using CWT data, measure hatchery returns
Meet hatchery production goals	Number of juvenile fish released - **Dependent on egg availability, goal is 1,000,000**	Estimate number of fish planted (weighing / counting fish), monitor proximity to hatchery production goals, number released recorded on Hatchery Division's "plants reports", data available on WDFW database.

Manage for maximum escapement to the hatchery rack	Catch and hatchery return rates	Monitor and document adult returns to the hatchery, catch records
Minimize interactions with listed fish through proper broodstock management	Total number of broodstock collected - **Goal: 2,000**	Measure number of fish actually spawned to meet eggtake goal Hatchery records Trap fish throughout run, dates and times recorded on Hatchery Division's "adult reports, data available on WDFW database. Spawner survey data, CWT data
	Sex ratios	
	Age Structure	
	Timing of adult collection/spawning - **September thru 1st week of October**	
	Hatchery stray rate	
	Return timing of hatchery adults - **September thru 1st week of October**	
	Adherence to spawning guidelines - **see section 8.3**	
Minimize interactions with listed fish through proper rearing and release strategies	Juveniles released as smolts	Future Brood Document Hatchery records CWT data
	Out-migration timing of listed fish / hatchery fish - **prior to mid-April (chinook) / March release**	
	Size and time of release - **500-750 fpp/ March release**	
Maintain stock integrity and genetic diversity	Effective population size	Spawning guidelines Spawner surveys
	Monitor divergence of hatchery fish morphology and behavior characteristics	
	HOR spawners	

Maximize in-hatchery survival of broodstock and their progeny; and Limit the impact of pathogens associated with hatchery stocks, on listed fish	Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health	Follow Co-Manager's Disease Policy Fish Health database
	Fish pathologists will diagnose fish health problems and minimize their impact	
	Vaccines will be administered when appropriate to protect fish health	
	A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings	
	Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.	
Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Monthly NPDES reports

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

Proposed collection level is 2,000 adult pink salmon.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fry	Whatcom Creek (01.0566)	1,000,000
Yearling (smolt)		

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

This is a new program with a small initial release of fish in 1998 and 2000 with 514,000 released in 2002.

1.13) Date program started (years in operation), or is expected to start.

1997.

1.14) Expected duration of program.

Ongoing

1.15) Watersheds targeted by program.

Whatcom Creek (01.0566)

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

There are no alternative actions being considered.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.1) List all ESA permits or authorizations in hand for the hatchery program.

None.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

- Identify the ESA-listed population(s) that will be directly affected by the program.

None

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

Puget Sound chinook

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- Describe the status of the listed natural population(s) relative to "critical" and "viable" population thresholds

Critical and viable population thresholds under ESA have not been determined.

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.

NA

-Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

NA

-Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.
Unknown

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Broodstocking impacts during collection/spawning of pinks unknown for chinook. There is no chinook program at the Whatcom Creek facility.

- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.

Unknown

-Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

See "take" table

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

NA

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

None

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

This program will be operated in accordance with a Cooperative Fish Production Agreement between Earl Steele, representing the Bellingham Technical College, and WDFW. That agreement will be consistent with the Future Brood Document and with this HGMP.

3.3) Relationship to harvest objectives.

3.3.1) Describe fisheries benefiting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.
Also provide estimated future harvest rates on fish propagated by the program, and on listed fish that may be taken while harvesting program fish .

A possible recreational fishery if adult return levels to the hatchery exceed those needed for eggtake.

3.4) Relationship to habitat protection and recovery strategies.

Whatcom Creek presently has no natural production of pink salmon.

3.5) Ecological interactions.

The Species Interaction Workgroup (SIWG) (1984) identified pinks as posing a low risk of competition and predation to naturally produced chinook in freshwater.

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

The Whatcom Creek Hatchery uses a gravity-fed water source from Whatcom Creek.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

There are no known hatchery practices that would lead to take.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Fish volunteer into the facility by way of a 12 step fish ladder rising 10 vertical feet. In the event of a low egg take at the facility, the option is to seine fish out of a tributary to the Middle Fork Nooksack River (01.0353).

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

NA

5.3) Broodstock holding and spawning facilities.

Whatcom Creek Hatchery has 2 - 4,500 cubic foot adult holding ponds.

5.4) Incubation facilities.

36 vertical stacks of trays consisting of 16 trays per stack (576 trays).

5.5) Rearing facilities.

There are two tanks of 10,500 cubic feet each, measuring 60' diameter by 4' deep. Fish can also be reared in the adult holding ponds.

5.6) Acclimation/release facilities.

Fish are released directly from the tanks or the holding ponds described in 5.3 and 5.5.

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

NA (new program).

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

There are no known hatchery practices that would lead to take.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

6.1) Source.

The goal is to collect adult pink salmon returning to the Whatcom Creek trap. Initially, broodstock source was the Nooksack River (Middle Fork), but in 2001 enough fish returned to the Whatcom Creek trap to collect broodstock. For 2003 and beyond, all broodstock collection will take place at Whatcom Creek.

6.2) Supporting information.

6.2.1) History.

New program. Broodstock source has been the Nooksack River (Middle Fork).

6.2.2) Annual size.

2,000 adults

6.2.3) Past and proposed level of natural fish in broodstock.

For brood years 97 and 99, 100% of broodstock were fish from the MF Nooksack River. In broodyear 2001, all broodstock was collected at the Whatcom Creek trap. The goal was for the program to establish a separate hatchery run to preclude the need for any further mining of the natural population.

6.2.4) Genetic or ecological differences.

None.

6.2.5) Reasons for choosing.

Indigenous stock.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

NA

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adults.

7.2) Collection or sampling design.

Only adult pink salmon that volunteer into the facility by way of the fish ladder described in 5.1 will be utilized for broodstock.

7.3) Identity.

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

2,000 adults (1,000:1,000)

7.4.2) Broodstock collection levels for the last 12 years (e.g. 1988-99), or the most recent years available:

Year	Adults Females	Males	Jacks	Eggs	Juveniles
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997	5	5		2,500	
1998					
1999	218	205		256,000	
2000					
2001	1,200	1,422		560,000	

Note - BY 2001 was first year adult pinks were collected at the Whatcom Cr. facility.

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Describe procedures for remaining within programmed broodstock collection or allowable upstream hatchery fish escapement levels, including culling.

Excess fish are not anticipated. Management plans preclude surplus, through use of harvest.

7.6) Fish transportation and holding methods.

NA

7.7) Describe fish health maintenance and sanitation procedures applied.

Consistent with Co-Manager's Fish Health Policy.

7.8) Disposition of carcasses.

Carcasses will be sold to the state-approved fish buyer.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

The risk of fish disease amplification will be minimized by following Co-manager Fish Health Policy sanitation and fish health maintenance and monitoring guidelines.

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

Randomly over the entire run.

8.2) Males.

See section 8.3. Backup males are not anticipated to be used.

8.3) Fertilization.

With large enough returns (as in BY 2001) will be using 5 X 5 matrix (5 females:5 males). Will immerse eggs in an iodine solution for one hour for disease prevention.

8.4) Cryopreserved gametes.

NA

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

NA

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. "egg to smolt survival") that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

In 2001, 560,000 eggs were taken and after eyeing 520,000 remained. At release 514,000 were planted into Whatcom Creek. Survival from eye-up to release was 98.8%.

9.1.2) Cause for, and disposition of surplus egg takes.

Excess egg take is not anticpated.

9.1.3) Loading densities applied during incubation.

10,000 eggs per tray

9.1.4) Incubation conditions.

Dissolved oxygen levels are monitored and a minimum of 7 ppm is maintained. Temperatures range from the low/mid 40's to the mid 50's. Dissolved oxygen levels are at saturation.

9.1.5) Ponding.

Fry are ponded when the fry are 100% buttoned up and no yolk is found inside. The fry are forced - ponded when they are at the proper size.

9.1.6) Fish health maintenance and monitoring.

Eggs are treated with formalin to control fungus. After shocking, eggs are picked using a Jensorter mechanical egg picker and are not treated after that time. After hatching, dead eggs are removed using hand egg pickers and vexar screens are added to the trays.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

NA

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available.

Fry to release - 98 to 99%.

9.2.2) Density and loading criteria (goals and actual levels).

Include density targets (lbs fish/gpm, lbs fish/ft3 rearing volume, etc).

Loading densities are never to exceed .5 lbs/ft^3. They were .25 lbs/ft^3 for BY 2001.

9.2.3) Fish rearing conditions

(Describe monitoring methods, temperature regimes, minimum dissolved oxygen, carbon dioxide, total gas pressure criteria (influent/effluent if available), and standard pond management procedures applied to rear fish).

Temperatures range between the high 40's to the high 50's.

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

Not available.

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

Not available.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Use Moore-Clarke dry diet at a feeding rate up to 6% B.W./day. Food conversion eficiency is approximately 1:1.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

These fish are checked routinely by WDFW fish pathologist. Disease treatments are prescribed by the Fish Health Specialist as needed.

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

None used.

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

None.

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.
NA

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1) Proposed fish release levels.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry	1,000,000	500-750	March	Whatcom Creek
Fingerling				
Yearling				

10.2) Specific location(s) of proposed release(s).

Stream, river, or watercourse: Whatcom Creek (01.0566)
Release point: Whatcom Creek (01.0566) at RM 0.5
Major watershed: Nooksack
Basin or Region: Puget Sound

10.3) Actual numbers and sizes of fish released by age class through the program.

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1988								
1989								
1990								
1991								
1992								
1993								
1994								
1995								
1996								
1997								
1998			1,561	1,200				
1999								
2000			218,000	500				
2001								
2002			514,000	800				
Average			244,520	833				

10.4) Actual dates of release and description of release protocols.

Fish have been released in March and April.

10.5) Fish transportation procedures, if applicable.

NA

10.6) Acclimation procedures

Fish are reared on Whatcon Creek water the entire time.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

None.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

None anticipated.

10.9) Fish health certification procedures applied pre-release.

Fish will be inspected for disease prior to release.

10.10) Emergency release procedures in response to flooding or water system failure.

None.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

The hatchery-produced pinks may serve as prey for larger migrating salmonids and other fish in the marine environment.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each "Performance Indicator" identified for the program.

The comanagers conduct numerous ongoing monitor programs, including catch, escapement, marking, tagging, and fish health testing. The focus of enhanced monitoring and evaluation programs will be on the risks posed by ecological interactions with listed species. WDFW is proceeding on four tracks:

1) An ongoing research program conducted by Duffy et al. (2002) is assessing the nearshore distribution, size structure, and trophic interactions of juvenile salmon, and potential predators and competitors, in northern and southern Puget Sound. Funding is provided through the federal Hatchery Scientific Review Group.

2) A three year study of the estuarine and early marine use of Sinclair Inlet by juvenile salmonids is nearing completion. The project has four objectives:

a) Assess the spatial and temporal use of littoral habitats by juvenile chinook throughout the time these fish are available in the inlet;

b) Assess the use of offshore (i.e., non-littoral) habitats by juvenile chinook;

c) Determine how long cohorts of juvenile chinook salmon are present in Sinclair inlet;

d) Examine the trophic ecology of juvenile chinook in Sinclair Inlet. This will consist of evaluating the diets of wild chinook salmon and some of their potential predators and competitors. Funding is provided by the USDD-Navy.

3) WDFW is developing the design for a research project to assess the risks of predation on listed species by coho salmon and steelhead released from artificial production programs. Questions which this project will address include:

a) How does trucking and the source of fish (within watershed or out of watershed) affect the migration rate of juvenile steelhead?

b) How many juvenile chinook salmon of natural origin do coho salmon and steelhead consume?

c) What is the rate of residualism of steelhead in Puget Sound rivers?

Funding needs have not yet been quanitifed, but would likely be met through a combination of federal and state sources.

4) WDFW is assisting the Hatchery Scientific Review Group in the development of a template for a regional monitoring plan. The template will provide an integrated assessment of hatchery and wild populations.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

See Section 11.1.1.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

Risk aversion measures will be developed in conjunction with the monitoring and evaluation plans.

SECTION 12. RESEARCH

12.1) Objective or purpose.

There is currently no research being conducted using Whatcom Creek Pinks.

12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table 1).

12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

SECTION 13. ATTACHMENTS AND CITATIONS

Seidel, Paul, 1983, Spawning Guidelines for Washington Department of Fish and Wildlife Hatcheries, Washington Department of Fish and Wildlife, Olympia.

SIWG (Species Interaction Work Group). 1984. Evaluation of potential species interaction effects in the planning and selection of salmonid enhancement projects. J. Rensel, chairman and K. Fresh, editor. Report prepared for the Enhancement Planning Team for implementation of the Salmon and Steelhead Conservation and Enhancement Act of 1980. Washington Department of Fisheries. Olympia, WA. 80pp.

Washinton Department of Fish and Wildlife. 1996. Fish Health Manual.Hatcheries Program, Fish Health Division, Washington Department of Fish and Wildlife, Olympia.

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

"I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973."

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____

Table 1. Estimated listed salmonid take levels by hatchery activity.

Listed species affected: Chinook ESU/Population: Puget Sound Activity: Hatchery operation				
Location of hatchery activity: Whatcom Creek Dates of activity: September-April Hatchery program operator: BellinghamTechnical College				
Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)			Unknown	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)			Unknown	
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.